

What is claimed is:

1. A lens barrel comprising:

an optical system including a short focal length for a wide angle of view; and

5 an ND filter in the shape of a disc which is provided on an optical axis of said optical system; wherein an optical density of said ND filter decreases in a direction radially outwards from a center of said ND filter.

2. The lens barrel according to claim 1, wherein  
10 said ND filter comprises:

a high optical density portion in the shape of a circle which is provided at a center of said ND filter; and

a low optical density portion provided around said  
15 high optical density portion,

wherein a diameter of said high optical density portion is smaller than effective aperture of said optical system.

3. The lens barrel according to claim 1, wherein  
20 said ND filter is fixed to a lens frame which supports at least one lens element of said optical system.

4. The lens barrel according to claim 1, wherein said optical system comprises a plurality of lens groups which are fixed to a corresponding plurality of lens frames,  
25 said ND filter being fixed to one of said plurality of lens

frames.

5. The lens barrel according to claim 1, further comprising a shutter unit, wherein said ND filter is fixed to said shutter unit.

5 6. The lens barrel according to claim 1, wherein said ND filter comprises:

a transparent optical element; and

a coating which is applied to a surface of said transparent optical element,

10 wherein a diameter of said coating is smaller than the effective aperture of said optical system.

7. The lens barrel according to claim 1, wherein said ND filter comprises at least two portions having different optical densities.

15 8. The lens barrel according to claim 6, wherein said transparent optical element is in the shape of a disc.

9. The lens barrel according to claim 1, wherein said lens barrel comprises a zoom lens.

10. The lens barrel according to claim 1, wherein  
20 said lens barrel comprises a telescoping type zoom lens.

11. The lens barrel according to claim 2, wherein said high optical density portion comprises at least two portions having different optical densities which are arranged concentrically with respect to said center of said  
25 ND filter.

12. A lens barrel comprising:

an optical system including a short focal length for  
a wide angle of view; and

an ND coating applied to at least one lens element  
5 of said optical system; wherein an optical density of said  
ND coating decreases in a direction radially outwards from  
an optical axis of said lens element.

13. The lens barrel according to claim 12, wherein  
said ND coating comprises:

10 a high optical density portion in the shape of a  
circle which is positioned at a center of said ND coating;  
and

a low optical density portion positioned around said  
high optical density portion,

15 wherein a diameter of said high optical density  
portion is smaller than effective aperture of said optical  
system.

14. The lens barrel according to claim 12, wherein  
said optical system comprises a plurality of lens groups,  
20 and

wherein said ND coating is applied to a frontmost lens  
group of said plurality of lens groups.

15. The lens barrel according to claim 12, wherein  
said optical system comprises a plurality of lens groups,  
25 and

wherein said ND coating is applied to a rearmost lens group of said plurality of lens groups.

16. The lens barrel according to claim 12, wherein said ND coating is in the shape of a circle having a diameter  
5 smaller than the effective aperture of said optical system.

17. The lens barrel according to claim 12, wherein said ND coating comprises at least two portions having different optical densities.

18. The lens barrel according to claim 12, wherein  
10 said optical system comprises a plurality of lens groups, said ND coating being applied to one of said plurality of lens groups.

19. The lens barrel according to claim 12, wherein said lens barrel comprises a zoom lens.

15 20. The lens barrel according to claim 12, wherein said lens barrel is a telescoping type zoom lens.

21. The lens barrel according to claim 14, wherein said high optical density portion comprises at least two portions having different optical densities which are  
20 arranged concentrically with respect to said center of said ND coating.

22. A photographing lens comprising:  
a plurality of lens elements; and  
at least one ND filter positioned on an optical axis  
25 of said plurality of lens elements,

wherein an optical density of said ND filter decreases in a direction radially outwards from said optical axis.

23. The photographing lens according to claim 22,  
5 wherein said ND filter is provided as a disc-shaped filter provided separately from said plurality of lens elements.

24. The photographing lens according to claim 22, wherein said ND filter is provided as a coating applied to at least one of said plurality of lens elements.